

CURRENT STATUS OF THE CLAIMS

1 1-35. (Canceled)

1 36. (Currently Amended) An apparatus for low-damage anisotropic electron dry etching
2 of a substrate, comprising:

3 a plasma reactor having a generally hollow interior adapted to substantially contain a
4 plasma having a plasma creation means, said plasma reactor adapted to have a plasma at a
5 first electrical potential therein;

6 a plasma creation means for generating a plasma, said plasma creation means at least
7 partially disposed in said plasma chamber;

8 a mechanical support within said plasma reactor adapted to receive said substrate,
9 wherein said mechanical support is electrically isolated from said plasma creation means;

10 a pulse waveform power source adapted to electrically bias said mechanical support
11 and said substrate placed thereon, said pulse waveform power source adapted to cycle
12 between a positive electrical potential and a negative electrical potential, wherein the
13 negative potential is below the first electrical potential, and wherein the positive potential is
14 such that electrons having kinetic energy less than 100 electron volts are attracted to the
15 substrate and etch material therefrom; and

16 a substrate etching means for etching material from the substrate, wherein the
17 substrate etching means comprises electrons from a plasma generated by the plasma creation
18 means and charge-neutral particles, wherein the electrons are attracted to the substrate by
19 the pulse waveform power source biasing of the substrate holder and substrate.

1 37-38. (Canceled)

1 39. (Previously Presented) The apparatus of claim 36, wherein said pulse waveform
2 power source biases the mechanical support such that ions of the plasma are attracted to the
3 substrate and electrically neutralize the substrate without damaging the substrate.

1 40. (Previously Presented) The apparatus of claim 36, further including:
2 a direct current power source adapted to electrically bias said mechanical support
3 and said substrate placed thereon.

1 41-42. (Canceled)

1 43. (Currently Amended) The apparatus of claim 45 36, wherein the wave form of the
2 pulse wave supplied by the pulse waveform power source is defined by a period having a
3 first predetermined interval at the positive electrical potential and a second predetermined
4 interval at the negative electrical potential, wherein during the first interval electrons
5 accumulate on the substrate, and wherein the second interval is of duration such that a
6 sufficient number of ions_s are attracted to the substrate to substantially neutralize the
7 accumulated electrons on the substrate.

1 44. (Currently Amended) The apparatus of claim 43, wherein absent biasing of the
2 substrate holder, the plasma and the substrate reach an equilibrium floating potential, and
3 wherein the magnitude of the negative potential is slightly below the floating first potential.

1 45. (New) The apparatus of claim 36, wherein said pulse waveform power source is
2 adapted to cycle between a positive electrical potential and a negative electrical potential,
3 and wherein the positive potential is such that electrons having kinetic energy less than 100
4 electron-volts are attracted to the substrate and etch material therefrom.

1 46. (New) An apparatus for low-damage anisotropic low energy electron enhanced
2 etching of a substrate, comprising:

3 a plasma reactor;

4 a plasma creation means at least partially disposed within the plasma reactor for
5 creating a plasma having positively charged ions and electrons;

6 a substrate holder disposed within the plasma reactor for receiving a substrate,
7 wherein the substrate holder is isolated from the plasma creation means; and

8 an electron etcher means for etching the substrate received by the substrate holder
9 with electrons from the plasma, wherein the electron etching means is in electrical
10 communication with the substrate holder.

1 47. (New) The apparatus of claim 46, wherein the electron etcher means includes a pulse
2 waveform power supply.

1 48. (New) The apparatus of claim 47, wherein the pulse waveform power supply is
2 adapted to bias the substrate holder with a positive electric potential such that electrons
3 having kinetic energy less than 100 electron volts are attracted to the substrate and etch
4 material therefrom.

1 49. (New) The apparatus of claim 48, wherein the pulse waveform power supply is
2 further adapted to bias the substrate with a negative electric potential such that positive ions
3 from the plasma are attracted to the substrate.

1 50. (New) The apparatus of claim 49, wherein the pulse waveform power supply biases
2 the substrate with the negative electrical potential for a predetermined amount of time such
3 that the substrate is approximately neutralized by positive ions attracted from the plasma.

1 51. (New) The apparatus of claim 46, wherein the electron etcher means includes a
2 direct current power supply.

1 52. (New) The apparatus of claim 46, further including:
2 a plasma disposed within the plasma reactor, the plasma created by plasma creation
3 means and consisting of electrons, positive ions, and charge neutral particles,
4 wherein the electron etcher means attracts electrons having kinetic energy
5 less than 100 electron volts from the plasma to substrate, and wherein the
6 electrons etch material from the substrate.

1 53. (New) The apparatus of claim 52, wherein the electron etcher means attracts positive
2 ions from the plasma to the substrate such that the positive ions approximately electrically
3 neutralize the substrate without damaging the substrate.